Claims

1. An optical data storage device, having a number of storage strata (1, 2, 3) arranged one above the other, each of which has a reflection layer, preferably a metal layer (12, 22, 32), which, in a predetermined optical wavelength range, has an initial absorption of at least 5%, preferably at least 10%, and an initial transmission of at least 5%, preferably at least 10%, and the transmission or reflection of which can be varied selectively by thermal treatment.

2. The optical data storage device as claimed in claim 1, characterized in that the transmission or reflection of the reflection layer or metal layer (12, 22, 32) can be varied selectively by irradiation with light (41).

3. The optical data storage device as claimed in claim 1 or 2, characterized in that the reflection layer or metal layer (12, 22, 32) has a transmission in the range of 20% to 90%.

4. The optical data storage device as claimed in one of claims 1 to 3, characterized in that each storage stratum (1, 2, 3) has a polymer layer (11, 21, 31) adjacent to the reflection layer or metal layer (12, 22, 32), the physical properties, preferably optical properties, of which polymer layer can be varied locally by heating.

5. The optical data storage device as claimed in claim 4, characterized in that the polymer layer (11, 21, 31) is stretched, preferably biaxially stretched.

6. The optical data storage device as claimed in claim 4 or 5, characterized in that the polymer layer (11, 21, 31) has at least one of the materials selected from the following group: polypropylene, polyvinyl

chloride, polyester, polyethylene terephthalate, polyethylene naphthalate, polycarbonate, polyamide, polystyrene, polymethylene methacrylate, polymethylpentene, polyimide, polyalkyl methacrylate.

7. The optical data storage device as claimed in one of claims 1 to 6, characterized in that the reflection layer or metal layer (12, 22, 32) has at least one of the metals selected from the following group: silver, aluminum, copper, gold, titanium.

8. The optical data storage device as claimed in one of claims 1 to 7, characterized in that the data storage device has one of the basic forms selected from the following group: disk-shaped, cylindrical with concentric arrangement of the storage strata, cylinderlike with spiral arrangement of the storage strata.

9. A method for writing information to an optical data storage device as claimed in one of claims 1 to 8, the information being introduced into a respective storage stratum (1, 2, 3) by means of a writing laser (40) by local variation of the optical properties, to be precise preferably initially at the storage stratum (1) lying closest to the focusing optical system of the writing laser (40) and progressing from there from storage stratum (2) to storage stratum (3), the transmission or reflection being set in a respective storage stratum (1, 2, 3) by thermal treatment.

10. The method as claimed in claim 9, characterized in that the thermal treatment is carried out by irradiation with laser light (41).

11. The method as claimed in claim 9 or 10, characterized in that the transmission or reflection is set in the storage stratum (1, 2, 3) written to last by subjecting the entire storage stratum to a thermal

treatment after the introduction of the information.

12. The method as claimed in claim 10, characterized in that the transmission or reflection is set in the storage stratum written to last by that region of the storage stratum that has just been written to being irradiated with a laser beam immediately after the writing of data.

13. The method as claimed in claim 10, characterized in that the transmission or reflection is set in the storage stratum written to last by the interspaces between the data structures being irradiated with a laser beam during the writing of data, preferably by means of the writing laser.

14. The method as claimed in one of claims 9 to 13, characterized in that the transmission or reflection of the individual storage strata (1, 2, 3) is set such that, when reading out data, the read signals which are reflected from the individual storage strata (1, 2, 3), and are preferably generated by means of a reading laser, have a maximum possible intensity that is approximately of identical magnitude for the individual storage strata (1, 2, 3).

15. The method as claimed in one of claims 9 to 14, characterized in that the writing laser operates in different wavelength ranges and/or a plurality of writing lasers are provided which operate in different wavelength ranges, a predetermined wavelength range being assigned to a predetermined storage stratum.

16. A method for reading out information from an optical data storage device as claimed in one of claims 1 to 8, in which case, in order to generate read signals, the beam of a reading laser is reflected at a storage stratum (1, 2, 3) onto which it is focused and the read signals are detected.

17. The method as claimed in claim 16, characterized in that the reading laser operates in different wavelength ranges and/or a plurality of reading lasers are provided which operate in different wavelength ranges, a predetermined wavelength range being assigned to a predetermined storage stratum.